CE EMF Report
(Low Power Electronic and Electrical Equipment)

Product Name: Base Band Unit

Product Model: BBU3910

Report Number: SYBH(R)03029446EA-3.3

Reliability Laboratory of Huawei Technologies Co., Ltd.

(Global Compliance and Testing Center of Huawei Technologies Co., Ltd.)

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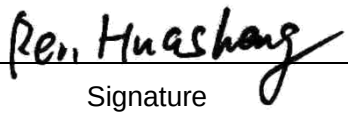
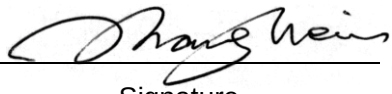
Applicant:	Huawei Technologies Co., Ltd.
Address:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
Product Name:	Base Band Unit
Product Model:	BBU3910

Date of Receipt Sample:	2017-05-31
Start Date of Test:	2017-05-31
End Date of Test:	2017-05-31

Test Result: Pass

Approved by Senior Engineer:	2017-05-31	Ren Huasheng	
	Date	Name	Signature

Prepared by:	2017-05-31	Zhang Weimin	
	Date	Name	Signature

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MODIFICATION RECORD

No.	Last Report No.	Modification Description
1	---	First report.

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1 General Information

1.1 Applied Standard

European Norms (EN):	EN 62479: 2010
Other References:	EN 62311: 2008 IEC 62479: 2010 IEC 62311: 2007 Council Recommendation 1999/519/EC ICNIRP Guideline 1998

1.2 Test Location

Test Location 1 (TL1):	Global Compliance and Testing Center of Huawei Technologies Co., Ltd. (Reliability Laboratory of Huawei Technologies Co., Ltd.)
Address:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

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2 EMF Exposure Requirements

As specified in clause 4.1 of EN 62479, the electronic and electro technical apparatus shall comply with the basic restriction for electric, magnetic and electromagnetic fields (0 Hz to 300 GHz) as specified in Annex II of Council Recommendation 1999/519/EC, as showed in the following table.

Note 1: The Council Recommendation 1999/519/EC is based on the ICNIRP Guideline 1998 with some additional restrictions.

Note 2: The time averaging in the EU-Recommendation applies.

Frequency range	Magnetic flux density (mT)	Current density (mA/m^2) (rms)	Whole body average SAR (W/kg)	Localised SAR (head and trunk) (W/kg)	Localised SAR (limbs) (W/kg)	Power density, S (W/m^2)
0 Hz	40	-	-	-	-	-
> 0 – 1 Hz	-	8	-	-	-	-
1 – 4 Hz	-	$8/f$	-	-	-	-
4 – 1000 Hz	-	2	-	-	-	-
1000 Hz – 100 kHz	-	f/500	-	-	-	-
100 kHz – 10 MHz	-	f/500	0.08	2	4	-
10 MHz – 10 GHz	-	-	0.08	2	4	-
10 – 300 GHz	-	-	-	-	-	10

Notes:

1. f is the frequency in Hz.
2. The basic restriction on the current density is intended to protect against acute exposure effects on central nervous system tissues in the head and trunk of the body and includes a safety factor. The basic restrictions for ELF fields are based on established adverse effects on the central nervous system. Such acute effects are essentially instantaneous and there is no scientific justification to modify the basic restrictions for exposure of short duration. However, since the basic restriction refers to adverse effects on the central nervous system, this basic restriction may permit higher current densities in body tissues other than the central nervous system under the same exposure conditions.
3. Because of electrical inhomogeneity of the body, current densities should be averaged over a cross section of 1 cm^2 perpendicular to the current direction.
4. For frequencies up to 100 kHz, peak current density values can be obtained by multiplying the rms value by $\sqrt{2}$ (~1.414). For pulses of duration t_p the equivalent frequency to apply in the basic restrictions should be calculated as $f = 1/(2t_p)$.
5. For frequencies up to 100 kHz and for pulsed magnetic fields, the maximum current density associated with the pulses can be calculated from the rise/fall times and the maximum rate of change of magnetic flux density. The induced current density can then be compared with the appropriate basic restriction.
6. All SAR values are to be averaged over any six-minute period.
7. Localised SAR averaging mass is any 10 g of contiguous tissue; the maximum SAR so obtained should be the value used for the estimation of exposure. These 10 g of tissue are intended to be a mass of contiguous tissue with nearly homogeneous electrical properties. In specifying a contiguous mass of tissue, it is recognised that this concept can be used in computational dosimetry but may present difficulties for direct

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Frequency range	Magnetic flux density (mT)	Current density (mA/m^2) (rms)	Whole body average SAR (W/kg)	Localised SAR (head and trunk) (W/kg)	Localised SAR (limbs) (W/kg)	Power density, S (W/m^2)

physical measurements. A simple geometry such as cubic tissue mass can be used provided that the calculated dosimetric quantities have conservative values relative to the exposure guidelines.

8. For pulses of duration t_p the equivalent frequency to apply in the basic restrictions should be calculated as $f = 1/(2t_p)$. Additionally, for pulsed exposures, in the frequency range 0.3 to 10 GHz and for localized exposure of the head, in order to limit and avoid auditory effects caused by thermoelastic expansion, an additional basic restriction is recommended. This is that the SA should not exceed 2 mJ kg^{-1} averaged over 10 g of tissue.

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3 EMF Exposure Assessment

3.1 STEP 1 – Determine the low-power exclusion level

The low-power exclusion level P_{max}, according to clause 4.2 and Annex A of IEC/EN 62479, is based on:

Basic restriction	Parameter	Description
☒ Localised SAR (100 kHz – 10 GHz) (Note 1)	Equation	$P_{max} = SAR_{limit} * m$
	Region of body	☒ Head and trunk ☐ Limbs
	SAR limit, SAR_{limit} (W/kg)	☒ 2 (for head and trunk) ☐ 4 (for limbs)
	Averaging mass, m (g)	10
	P_{max} (mW)	☒ 20 (for head and trunk) ☐ 40 (for limbs)
	Averaging time (min)	6
☐ Power Density (10 GHz – 300 GHz)	Equation	$P_{max} = S_{limit} * a$
	Power density limit, S_{limit} (W/m^2)	10
	Averaging area, a (cm^2)	20 (Note 2)
	P_{max} (mW)	20
	Averaging time (min)	$68/f^{1.05}$ (f in GHz) (Note 2)
Note 1: Though the localised SAR is specified for 100 kHz to 10 GHz, the EN 62479 applies to operating range starting from 10 MHz. Note 2: The requirement is not defined in Council Recommendation 1999/519/EC, but in referred ICNIRP Guideline 1998.		

3.2 STEP 2 – Select compliance route

According to clause 4.1 of IEC/EN 62479, choose compliance route according to the available antenna power and/or average TRP of the combination of transmitter and antenna(s) with highest configuration:

☒ Route A – Inherently compliant:

The EUT as a low-power equipment is an incandescent light bulbs and audio/visual (A/V) equipment, information technology equipment (ITE) and multimedia equipment (MME) that does not contain radio transmitters.

☐ Route B – Input power:

The input power level to electrical or electronic components that are capable of radiating electromagnetic energy in the relevant frequency range is so low that the available antenna power and/or the average total radiated power cannot exceed the low-power exclusion level defined in Step 1. In this case, the input power level is (see detailed in product specifications): _____ mW.

☐ Route C – Allowed output power:

The available antenna power and/or the average total radiated power are limited by product standards for transmitters to levels below the low-power exclusion level defined in Step 1. In this case (see detailed in RF report(s)):

☐ the limit of available antenna power in product standard is: _____ mW in ETSI EN _____, and/or

☐ the limit of average TRP in product standard is: _____ mW in ETSI EN _____.

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☐ Route D – Measurement or calculation:

Measurements or calculations show that the available antenna power and/or the average total radiated power are below the low-power exclusion level defined in Step 1. In this case (see detailed in RF report(s)):

☐ the measured or calculated available antenna power is: _____ mW, and/or

☐ the measured or calculated average total radiated power is: _____ mW.

3.3 STEP 3 – Confirm compliance

As showed in Step 2, the EUT:

☒ Inherently comply with low-power exclusion level, or

☐ Meets low-power exclusion level.

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4 Conclusion

The EUT, as a low-power electronic and electrical equipment, is deemed to comply with the EMF exposure basic restrictions.

SUPPLEMENTARY INFORMATION:

- The EUT shall be properly operated such that exposures will be compliant with the basic restrictions.
- The EUT cannot be modified to change its power so that it could exceed the low-power exclusion level.

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Annex A Definitions and Abbreviations

CE	conformité européenne (European conformity)
ELF	extremely low frequency
EMF	electromagnetic field
EUT	equipment under test
ICNIRP	international commission on non-Ionizing radiation protection
RF	radio frequency
RMS, rms	root mean square
SAR	specific absorption rate
TRP	total radiated power

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END

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